

Remarks

Claims 15-21, 23-25 and 48 are currently pending.

35 U.S.C. § 103

The Examiner rejected claims 15-19, 21, 25 and 48 under 35 U.S.C. § 103(a) as being unpatentable over Ng et al. (US 6,667,360) in view of Encyclopedia Britannica (www.britannica.com/EBchecked/topic/350437/lubrication/4341/Solid-lubricants).

Applicants traverse this rejection for the following reason.

Independent claims 15 and 48 of the present application recite a tool in the form of a forming tool which consists of a plastic material with nanoscale particles and a material with gliding properties embedded in the plastic material and a method for converting a metal work piece using such a forming tool.

While it is true Ng et al. discloses a polymer nanocomposite, Ng et al. fails to disclose a material with gliding properties embedded in the polymer nanocomposite as presently claimed. Moreover, Ng et al. teaches polymer nanocomposites suitable for use as stamps for small electronic components. A stamp for small electronic components is much different than a forming tool. This difference is demonstrated in Table 1 where the elastic modulus for Ng et al.'s nanoparticle filled epoxy exhibits an elastic modulus of only 3.3 GPa. *See U.S. Pat. No. 6,667,360* at col. 6, Table 1. A polymer nanocomposite having such a low elastic modulus would not be suitable for use as a forming tool which is exposed to high stresses in deep drawing large and thick metallic sheets.

The Examiner has added the teachings of the Encyclopedia Britannica electronic publication for the purpose of teaching solid lubricants such as graphite and molybdenum disulfide. However, the Examiner has not demonstrated that this electronic publication

was publicly available before Applicants filing date and therefore it is not prior art. Assuming arguendo that it is, this electronic publication merely teaches that such solid lubricants are chemically inert and have high thermal stability. Neither Ng et al. nor this electronic publication, alone or in combination, teach or suggest that combining nanoparticles and a material with gliding properties and embedding them in plastic would successfully produce a forming tool used in deep drawing thick metallic sheets. Also, these publications, alone or in combination, do not teach or suggest a method for converting a metal workpiece using such a forming tool.

Nevertheless, Applicants have surprisingly found that introducing nanoparticles into a plastic material increased the elastic modulus of the plastic material from 3 GPa to 11 GPa (see Figure 4 of the present application) and that further introducing a material with gliding properties maintained the abrasion strength of the plastic material over a large number of consecutive lifts (see Figure 6 of the present application) making the plastic material suitable for use as a tool in the form of a forming tool. In contrast, Ng et al. teaches that the elastic modulus of its nanoparticle filled epoxy (3.3 GPa) is not much different than pure epoxy (3.0 GPa) or a microparticle-filled epoxy (3.32 GPa). *See U.S. Pat. No. 6,667,360* at col. 6, Table 1. Thus, one of ordinary skill in the art could not have predicted Applicants surprisingly result from the teachings of Ng et al. or the Encyclopedia Britannica electronic publication and the presently claimed invention is not rendered obvious by these publications.

The Examiner also rejected dependent claims 20, 23 and 24 as being unpatentable over the publications and reasoning in Paragraphs 9-15 of the Office Communication mailed November 12, 2008. For the reasons set forth above, independent claim 15 is not

obvious. Therefore, all claims depending on claim 15 are also not obvious. Accordingly, Applicants respectfully request the rejections of dependent claims 20, 23 and 24 be withdrawn.

Conclusion

Applicants respectfully submit that the application is now in condition for allowance, and respectfully request an issuance of a Notice of Allowance directed towards the pending claims. Should any fee be due in connection with the filing of this document, the Commissioner for Patents is hereby authorized to deduct said fee from Huntsman Corporation Deposit Account No. 08-3442.

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